

Approved syllabus: dated 16-06-2017

B.Sc. APPLIED NUTRITION AND PUBLIC HEALTH
(choice based credit system)

FIRST YEAR SEMESTER I				
CODE	COURSE TITLE	COURSE TYPE	HPW	CREDITS
BS101	ENVIRONMENTAL STUDIES	AECC I	2	2
BS102	ENGLISH	CC- I A	5	5
BS103	SECOND LANGUAGE	CC -2 A	5	5
BS104	NUTRITIONAL BIOCHEMISTRY-I	DSC- IA	4T+2P=6	4+1=5
BS105	OPTIONAL II	DSC -2A	4T+2P=6	4+1=5
BS 106	OPTIONAL III	DSC- 3A	4T+2P=6	4+1=5
	TOTAL			27
SEMESTER II				
BS 201	GENDER SENSITIZATION	AECC 2	2	2
BS 202	ENGLISH	CC- I B	5	5
BS 203	SECOND LANGUAGE	CC -2 B	5	5
BS 204	NUTRITIONAL BIOCHEMISTRY-II	DSC- IB	4T+2P=6	4+1=5
BS 205	OPTIONALII	DSC- 2B	4T+2P=6	4+1=5
BS 206	OPTIONAL III	DSC- 3B	4T+2P=6	4+1=5
	TOTAL			27
SECOND YEAR - SEMESTER III				
BS 301	SEC	SEC - I	2	2
BS 302	ENGLISH	CC- IC	5	5
BS 303	SECOND LANGUAGE	CC -2C	5	5
BS 304	FOOD SCIENCE	DSC - IC	4T+2P=6	4+1=5
BS 305	OPTIONAL- II	DSC- 2C	4T+2P=6	4+1=5
BS 306	OPTIONAL- III	DSC- 3C	4T+2P=6	4+1=5
	TOTAL			27
SEMESTER IV				
BS 401	SEC	SEC - 2	2	2
BS 402	ENGLISH	CC- I D	5	5
BS 403	SECOND LANGUAGE	CC -2 D	5	5
BS 404	FAMILY & COMMUNITY NUTRITION	DSC – 1D	4T+2P=6	4+1=5
BS 405	OPTIONAL- II	DSC- 2D	4T+2P=6	4+1=5
BS 406	OPTIONAL- III	DSC- 3D	4T+2P=6	4+1=5
	TOTAL			27
THIRD YEAR – SEMESTER V				
BS501	SEC	SEC - 3	2	2
BS 502	COMMUNICATION	AECC 3	2	2

BS 503	CLINICAL DIETETICS	DSC – 1E	3T+2P=5	3+1=4
BS 504	OPTIONAL- II	DSC – 2E	3T+2P=5	3+1=4
BS 505	OPTIONAL- III	DSC – 3E	3T+2P=5	3+1=4
BS 506	A) FOOD SAFETY & QUALITY CONTROL (OR) B) FOOD PRESERVATION	DSE-1E	3T+2P=5	3+1=4
BS 507	OPTIONAL II A/B/C	DSE – 2E	3T+2P=5	3+1=4
BS 508	OPTIONAL II A/B/C	DSE – 3E	3T+2P=5	3+1=4
	TOTAL			28
SEMESTER- VI				
BS 601	SEC	SEC-4	2	2
BS 602	GENERIC ELECTIVE	GE - 1	2T	2
BS 603	PUBLIC HEALTH	DSC- 1F	3T+2P=5	3+1=4
BS 604	OPTIONAL- II	DSC – 2F	3T+2P=5	3+1=4
BS 605	OPTIONAL- III	DSC – 3F	3T+2P=5	3+1=4
BS 606	A) FOOD HYGIENE &SANITATION (OR) B) ADVANCED DIETETICS	DSE – 1F	3T+2P=5	3+1=4
BS 607	OPTIONAL II A/B/C	DSE – 2F	3T+2P=5	3+1=4
BS 608	OPTIONAL II A/B/C	DSE – 3F	3T+2P=5	3+1=4
	TOTAL			28
	TOTAL CREDITS			164

CC-Core Course

AECC- Ability Enhancement Compulsory Course

DSC- Discipline Specific Course

SEC- Skill Enhancement Course

DSE- Discipline Specific Elective

GE- General Elective

HPW- Hours Per Week

SUMMARY OF CREDITS FOR B.SC (APPLIED NUTRITION & PUBLIC HEALTH)
PROGRAM

S.NO	COURSE CATEGORY	NO.OF COURSES	CREDITS PER COURSE	CREDITS
1.	AECC	3	2	6
2.	SEC	4	2	8
3.	CC	8	5	40
4.	DSC	12	5	60
5.	DSC	6	4	24
6.	DSE	6	4	24
7.	GE	1	2	2
	TOTAL	40		164
	OPTIONALS(TOTAL)	24		108

B.Sc., (APPLIED NUTRITION AND PUBLIC HEALTH) - CBCS

Discipline specific Course Papers (credit: 05 each) (CP 1-4)

- 1) Nutritional Biochemistry (1) (4) + Lab (2)
- 2) Nutritional Biochemistry (2) (4) + Lab (2)
- 3) Food Science (4) + Lab (2)
- 4) Family and Community Nutrition (4) + Lab (2)

Discipline Specific Elective Papers (credit: 05 each) (DSE 1, DSE 2): Choose 2

- 1) Food Preservation (4) + Lab (2)
- 2) Sanitation, Hygiene (4) + Lab (2)
- 3) Clinical Dietetics (4) + Lab (2)
- 4) Public Health (4) + Lab (2)

REVISED SYLLABUS B.SC APPLIED NUTRITION & PUBLIC HEALTH

I SEMESTER SYLLABUS (Theory)

Nutritional Biochemistry I

60 hours

UNIT I

16 hours

Introductory Nutrition, Definition of Nutrition, Food, Nutrients, or Proximate Principles, Nutritional needs of body, specific role of nutrients, classification of foods, food groups. Carbohydrates — Composition and chemistry, classification, sources, nutritional significance, digestion, absorption and metabolism - Glycolysis, TCA Cycle with bioenergetics. Gluconeogenesis endocrine regulation of Cell Metabolism

UNIT II

18 hours

Proteins: Composition and chemistry, classification sources, functions, digestion and absorption, denaturation. Nutritional significance of some amino acids. General properties of proteins. Outlines supplementary value of amino acids. Deficiency of Protein — PEM definition, classification, and age groups affected
Nucleic acids: Composition — purine and pyrimidine bases DNA, RNA — structure and biological functions

UNIT III

14 hours

Lipids: Composition Chemistry classification sources, function, chemical properties — digestion and absorption, essential fatty acids — functions and deficiency, elements of fat analysis, Metabolism: B- oxidation of fatty acids. Types of Rancidity, Ketosis

UNIT IV

12 hours

Energy Metabolism: Types of energy, energy yielding food factors, energy units determination of energy value of food using bomb calorimeter. PFV (Physiological Fuel Value) of foods, direct indirect calorimetry, RQ, SDA of food. Determination of BMR and factors affecting BMR

II SEMESTER SYLLABUS

Practical Paper

Nutritional Biochemistry 1

Total no of practical's: 8

I. Introduction to Qualitative and Quantitative of Nutrients

II. Carbohydrates:

1. Qualitative analysis of Glucose
2. Qualitative analysis of Fructose
3. Qualitative analysis of Maltose
4. Qualitative analysis of Sucrose
5. Qualitative analysis of Lactose
6. Qualitative analysis of Starch

III. Proteins

1. Qualitative analysis of Proteins

IV. Qualitative analysis of Minerals

II SEMESTER SYLLABUS(THEORY)

NUTRITIONAL BIOCHEMISTRY II 60 hours

UNIT I 20 hours

Vitamins: Fat soluble — A, D, E, K. History, Chemistry, physiological functions, sources, requirements, effects of deficiency.

Water soluble vitamins — B Complex — Thiamine, Riboflavin, Niacin, Pantothenic Acid, Folic Acid, Vitamin B 12, Biotin and Pyridoxine, Vitamin C. History, requirements, functions, sources, effect of deficiencies.

UNIT II 16 hours

Macro and Micro Minerals — Calcium, Phosphorous, Iron, Fluorine, Iodine. History, Chemistry, physiological functions, sources, requirements, deficiency. Role of Zinc and Selenium as antioxidants.

UNIT III 12 hours

Water balance and electrolyte balance — regulation of water balance, abnormalities of water balance, water compartments in the body. Japanese Water Therapy.

UNIT IV 12 hours

Enzymes — Definition, classification, properties, mechanism of enzyme action, factors affecting enzyme action, enzyme inhibitions. Enzyme in Clinical diagnosis.

Hormones — Major endocrine glands and their secretions, classification, general mode of action — Insulin, Thyroxin. Endocrine regulation in fasting.

II SEMESTER SYLLABUS

PRACTICAL PAPER

Nutritional Biochemistry II

Total no of practical's: 7

I. Quantitative analysis of carbohydrates

1. Estimation of reducing sugar by Benedict's method
2. Estimation of Fructose by Roe's Resorcinol method

II. Estimation of protein by Biuret method

III. Fats

1. Determination of saponification number of oil.

IV. Vitamins

1. Estimation of ascorbic acid by 2,6, dichlorophenol, indophenols method.
Estimation of ascorbic acid in lemon / cabbage / green chilies

V. Minerals

1. Estimation of Calcium in GLV.

BOOKS RECOMMENDED:

1. A Textbook of Biochemistry By A.V.S.S Rama Rao.
2. Food & Nutrition Volume I By Swaminathan.
3. A Text Book Of Biochemistry By U. Satyanaryan.

III SEMESTER SYLLABUS(THEORY)

FOOD SCIENCE 60 HOURS

UNIT I: BASICS OF FOOD SCIENCE, CERERALS & MILLETS 15 hours

- Definition of food science, functions of food, objectives of cooking, preliminary preparations, cooking methods. Role of functional foods – antioxidants, phytochemicals, prebiotics & probiotics.
- Cereals & millets: Cereal- Structure, Nutritive value, Composition, methods of processing, role in cookery.
- Millets- Types of millets- Bajra, Jowar & Maize

UNIT II: PULSES & LEGUMES, MILK & MILK PRODUCTS 15 hours

- Pulses & legumes: Nutritive value, germination, Anti nutritional factors, elimination, role of pulses in cookery.
- Milk & milk products: types, nutritive value, composition, processing of milk, role in cookery
- Different types of Fermented & non fermented milk products.
- Processing of cheese & curd.
- Processing of paneer & khoa.

UNIT III: FLESHY FOODS, SPICES, CONDIMENTS & BEVERAGES 15 hours

- Fleshy foods (a) Meat: sources & types, nutrient composition, post mortem changes & processing of meat.
(b) Fish: Classification & types of fish, selection of fish.
(c) Eggs: Structure, composition, nutritive value, role of egg in cookery.
- Spices, condiments & beverages- types, role in cookery

UNIT IV: VEGETABLES & FRUITS, SUGAR & JAGGERY, FATS & OILS 15 hours

- Vegetables: classification, composition- pigments, organic acids, enzymes, flavor compounds, Nutritive value.
- Fruits: definition, classification, composition- pigments, water content, cellulose & pectic substances, flavor constituents, polyphenols, nutritive value, changes during ripening, enzymatic browning.
- Sugar & jaggery: sources, types, role in cookery.
- Fats & oils: Sources, types, spoilage- rancidity, hydrogenation. Role in cookery.

BOOKS RECOMMENDED:

1. Text book of Sri lakshmi. B- food science 5th edition, New age international publishers, New Delhi – 110002, 2011
2. Norman potter N- food science, CBS publishers & distributors, New Delhi- 110002, 2007

REFERENCE BOOKS:

1. Shakuntala Manay N- Foods Facts & Principles, New Age International Publishers, New Delhi- 110002, 2005

III SEMESTER SYLLABUS
PRACTICAL PAPER
FOOD SCIENCE

Total No. Of Practicals:7

1. Demonstration of Standard Weights & Measures.
2. Cookery Practical's in:
 - i. Cereals.
 - ii. Pulses.
 - iii. Cereal & Pulse Combination.
 - iv. Milk & Its Products.
 - v. Vegetables & Fruits.
 - vi. Fleshy Foods- Meat, Fish & Eggs.

IV SEMESTER SYLLABUS(THEORY)

FAMILY & COMMUNITY NUTRITION 60HOURS

UNIT I: BASICS OF MEAL PLANNING

10 hours

- Definition of Balanced diets, RDA, Factors affecting RDA, ICMR recommendations.
- Food pyramid, my food plate.
- Food Exchange List (raw), food composition tables.
- Principles & objectives of meal planning
- Nutrient requirement & meal planning for adults, changes in nutrient requirement according to sex, age & activity.

UNIT II: NUTRITIONAL REQUIREMENT DURING PREGNANCY, LACTATION & INFANCY

16 hours

Nutrient requirement & RDA for

- Expectant mother- physiological changes, dietary modification & complications.
- Lactation- general dietary guidelines & role of special foods.
- Infancy- growth & development, breast feeding v/s artificial feeding, factors to be considered while preparing & introducing supplementary foods.

UNIT III: NUTRIENT REQUIREMENT FOR PRE SCHOOLERS, SCHOOL GOING CHILD & ADOLESCENT

15 hours

Nutrient requirement & RDA for

- Preschoolers- problems in feeding, factors affecting nutritional status.
- School going child- importance of breakfast, packed lunch & mid-day meal programs- ICDS, SNP.
- Adolescence- eating disorder, anemia, anemia prophylaxis program.

UNIT IV: NUTRITION REQUIREMENT FOR GERIATRIC GROUP & NUTRITIONAL ASSESSMENT

15 hours

- Geriatrics- RDA & nutritional requirement during old age, physiological changes & dietary modification.
- Nutritional Assessment- Methods of Assessment of Nutritional status, Anthropometric, Biochemical, Clinical methods & Diet surveys.

BOOKS RECOMMENDED:

1. Sri Lakshmi. B- Dietetics, New Age International Publishers, New Delhi- 110002, 2011.
2. Sri Lakshmi.B- Nutrition Science, 5th Edition, New Age International Publishers, New Delhi- 110002, 2011.

IV SEMESTER SYLLABUS
PRACTICAL PAPER
FAMILY & COMMUNITY NUTRITION

Total No. Of Practicals:10

1. Planning of diets
 - a. Adult- according to sex & activity.
 - b. Pregnant & lactating women.
 - c. School going child.
 - d. Adolescents.
 - e. Old age group.

2. Preparation of diets - 4 practical sessions.

3. Formulation & preparation of weaning mix.

V SEMESTER SYLLABUS

PRACTICAL PAPER CLINICAL DIETETICS

Total No. Of Practicals:10

I. Planning of diets and calculation of nutritive value of the following diets

- a. Diet for peptic ulcer.
- b. Diet for obesity (low calorie diet).
- c. Diet for diabetes (1600 and 1800 kcals diet).
- d. Diet for cardiac disorders (low fat, full fluid diets).
- e. Diet for renal disorders (low sodium, low protein and high protein diets).
- f. Diet for liver disorders (low fat, moderate protein diet for jaundice and high calorie, high protein diet for cirrhosis).
- g. High Fiber Diet.

II. Preparation of diets- 3 practical sessions

DISCIPLINE SPECIFIC ELECTIVE PAPER 1

V- SEMESTER SYLLABUS(THEORY)

FOOD PRESERVATION 60hours

UNIT I

18 hours

- Food Technology and its application, Role of Food technology in combating malnutrition in developed countries.
- Food spoilage and nutrient losses during storage- physical, chemical and microbial spoilage of foods.

UNIT II

18 hours

- Food Preservation-the importance and general principles of food preservation.
- Home scale methods of food preservation like drying, refrigeration, pickling, use of sugars and chemical preservations.

UNIT III

12 hours

- Commercial methods of food preservation, Preservation by high temperature, low temperature, dehydration, concentration, fermentation, radiation, chemicals.

UNIT IV

12 hours

- Enhancement of nutritional value of foods by food fortification, enrichment, substitution, supplementation, fermentation & germination.
- Novel protein foods

V - SEMESTER SYLLABUS

PRACTICAL PAPER FOOD PRESERVATION

Total No. Of Practicals:8

- I. Food Processing & Preservation.
 - a. Preparation of jams(3-4 varieties)
 - b. Preparation of jellies (3-4 varieties)
 - c. Preparation of sauces, tomato, chili and tamarind.
 - d. Preparation of squashes(3-4 varieties)
 - e. Preparation of pickles (3-4 varieties)
 - f. Preparation of sun dried fruits and vegetable products.

DISCIPLINE SPECIFIC COURSE

VI - SEMESTER SYLLABUS(THEORY)

PUBLIC HEALTH

60HOURS

UNIT I

12 hours

- Health and Nutrition- education-definition, components, principles of health-education, methodology- individual, group and mass methods use of audio visual aids.

UNIT II

12 hours

- Medical entomology, Control of household pest with special reference to mosquito, housefly etc.;Environmental, chemical, biological and generic control.

UNIT III

18 hours

- Immunity - (i) Classification, specific and non-specific immunity
(ii)Immunoglobulins,
(iii) Cellular and hormonal, immune response
(iv) Immunization active and passive immunization schedule
(v) Immunizing agents,
(vi)Hazards of immunization.

UNIT IV

18 hours

- Primary health care system with special reference to Maternal and Child Health care and maternal& infant mortality and morbidity
- Primary health system functioning in rural areas, health indicators and various health organizations, Malaria and AIDs Control-NHP, WHO, UNICEF.

VI - SEMESTER SYLLABUS

PRACTICAL PAPER

PUBLIC HEALTH

Total No. Of Practicals:10

1. Preparation of 3 audio visual aids like charts, posters, models related to health and nutrition.
2. Conduct of health and nutrition education classes on various target groups like slum dwellers, school children, housewives etc.
3. Formulation and preparation of low cost nutritious recipe.
4. Conduct of survey on health and hygiene practices among high and low income groups.
5. Field visit.

DISCIPLINE SPECIFIC ELECTIVE PAPER 2
VI - SEMESTER SYLLABUS(THEORY)

FOOD SANITATION & HYGIENE

60HOUR

UNIT I

15 hours

- Definition of Public Health, Hygiene, Social and preventive medicine, basic aspects of personal hygiene.
- Epidemiology methods, introduction to Analytical, Experimental and Descriptive methods, diseases transmission.
- Water- sources, Impurities, Hardness of water and Principles of water purification- commercial and domestic.

UNIT II

15 hours

- Food Borne Disorders:
 - Food borne infections- Typhoid, Para typhoid, cholera, infective hepatitis, amoebiasis
 - Food borne intoxications- Disorders caused by; Natural toxins, chemical toxins and Microbiological toxins in food- Lathyrism, staphylococcal intoxication, Botulism, clostridium perfringens, Mycotoxins.

UNIT III

12 hours

- Food handling and Public Health: Preventing food borne illness and the spread of communicable disease; Sanitation of food serving institution; environmental sanitation, hygienic in food handling and personal hygiene of food handler.

UNIT IV

18 hours

- Food adulteration: common, adulterants, and health hazards. Food standards and food laws. National and International; PFA, FSSAI, HACCP, ISO Certification;
- Consumer guidance society, Consumer rights, Consumer court, Central facilities for assessing food adulteration, Role of food inspectors.

VI - SEMESTER SYLLABUS

PRACTICAL PAPER

FOOD SANITATION & HYGIENE

Total No. Of Practicals:8

1. Identification of adulterants in various classes of food samples
 - a. cereals, pulses,
 - b. milk & milk products-milk, paneer,
 - c. Ghee and oil;
 - d. spices and condiments-chili powder, Turmeric; Pepper; Asafoetida, dhania, salt whole and powdered spices,
 - e. sugar, Honey & jaggery, Tea, Coffee, and miscellaneous foods.
2. Estimation of Hemoglobin content of blood.
3. Biochemical analysis of Urine Glucose, Albumin and Ketones.
4. Testing the hardness of water.

B.Sc. Applied Nutrition and Public Health as per CBCS pattern

Course Structure

I	Core Papers				
	Paper Title	Semester	No. of Theory hours	No. of Practical hours	No. of Credits
1.	Nutritional Biochemistry 1	I	60	45	4+1=5
2.	Nutritional Biochemistry 2	II	60	45	4+1=5
3.	Food Science	III	60	45	4+1=5
4.	Family and Community Nutrition	IV	60	45	4+1=5
II	Discipline Specific Elective				
	Paper Title	Semester	No. of Theory hours	No. of Practical hours	No. of Credits
DSE 1	Therapeutic Nutrition	V	60	45	4+1=5
DSE 1A	Food Preservation	V	60	45	4+1=5
DSE 2	Food Sanitation and Hygiene	VI	60	45	4+1=5
DSE 2A	Public Health	VI	60	45	4+1=5
III	Skill Enhancement Course				
	Paper Title	Semester	No. of Theory hours	No. of Practical hours	No. of Credits
SEC 1	SEC 1	III	30	-----	2
SEC 2	SEC 2	IV	30	-----	2
SEC 3	SEC 3	V	30	-----	2
SEC 4	SEC 4	VI	30	-----	2